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Ectebin in Tuberculosis.—Ectebin is a salve containing tuberculin and killed tubercle bacilli. When it is rubbed into the skin of a tuberculous patient, the reaction which follows carries the dead but morphologically intact tubercle bacilli into the deeper layers of the skin, where they remain as partial antigens for antibody formation. It is best applied weekly, alternately on the breast and back. It leads often, after three to four days, to a marked dermatitis, which can be used for differential diagnosis, as it occurs only in cases of definite tuberculosis. Good results are reported in several early and moderately advanced cases. Severe focal reactions were not observed.—*Das Ektebin, ein bewährtes Tuberkuloseheilmittel für den praktischen Ärzt, Neiss, München. med. Wchnschr., January 26, 1923, 118.*

Immunization with Tubercle Bacilli Exposed to Sunlight.—Exposure of tubercle bacilli to direct sunlight during summer time for one-half hour kills the bacilli; exposure for twenty-five minutes was not sufficient. Treatment of the bacilli by direct sunlight for a sufficient time to weaken them, and using these weakened bacilli for immunizing purposes has great possibilities.—*Harmful Effects of Sun Light on Bacillus Tuberculosis Hominis and the Experimental Immunization with the Exposed Bacilli, H. Kiyono, Nihon Biseibutsugakkwai Zasshi, June, 1922, xvi, no. 6, Abstract from Japan Medical World, December, 1922, ii, 352.*

Immunization with Alcohol-Treated Tubercle Bacilli.—Animals immunized with living tubercle bacilli treated with alcohol were found of service in these experiments. Bacilli treated with 40 to 50 per cent alcohol would immunize animals.—*Harmful Effects of Alcohol on Bacillus Tuberculosis Hominis and the Experimenta Immunization with the Alcohol Treated Tubercle Bacilli, H. Kiyono, Nihon Biseibutsugakkwai Zasshi, July, 1922, xvi, no. 7, Abstract from Japan Medical World, December, 1922, ii, 352.*

Tuberculin in Experimental Tuberculosis.—The harmful constituents of tubercle bacilli in the treatment of tuberculosis can be eliminated by treating the bacilli either with ammonium sulphate or pancreatin. It was found also that the alcohol-extractable constituents of tubercle bacilli have an inhibitory influence upon the caseous degeneration and formation of tubercles in experimental tuberculosis.—*Influences of Tuberculin and Constituents of Tubercle Bacilli against Experimental Tuberculosis, K. Yoshizawa, Kekkaku Zassi, August, 1922, xxi, no. 8, Abstract from Japan Medical World, December, 1922, ii, 354.*

Silicosis.—This report covers observations of patients employed in the ganister brickworks at Oughtibridge, England. The mineral which is quarried or mined contains, when of best quality, 87 to 96 per cent of silica. Eliminating groups of workmen undergoing negligible exposure to the dust, it was found that 8.3 per cent of the men examined had silicosis or tuberculosis. In making the diagnosis, silicosis accompanied by active tuberculosis is obvious, death occurring with great emaciation, and mostly in the age group of forty to forty-five years. Advanced uncomplicated silicosis is usually found in older workers, the average age in this series being fifty-one years. Dyspnea and difficult expectoration were the chief complaints. Emaciation was less than with tuberculosis. The physical signs were chiefly those of pleurisy with adhesions and of pulmonary consolidation; also bronchitic

sounds with evidence of arteriosclerosis and of chronic alcoholism. In the group with early or intermediate silicosis the youngest patient was thirty years old and the shortest time of exposure to dust was six years. The prominent symptom is some shortness of breath, although sometimes silicosis, found radiographically, was symptomless. Diminished lung function may be evidenced by rigidity of the chest wall, limitation of movement or deficient expansion. On the average this type of patient could hold his breath only twenty seconds. The vital capacity was reduced as much as 40 per cent. In advanced pure silicosis the X-ray may show large opactities, particularly toward the hilum. The apices are usually rather opaque, and throughout the parenchyma typical mottling, yielding a characteristic "snowstorm" appearance, is found; this is finer and more diffuse than that of tuberculosis. In older workers fibrotic thickening of the normal arborization occurs. In early silicosis mottling is shown at the pulmonary apices and upper and outer margins. The bronchial striations toward the apices and the hilum shadows are heavy. It may be difficult to diagnose a superadded tuberculosis. The predisposing effect of nasal defect in pneumokoniosis is indubitable and the rare cases of clinical anthracosis that one sees are in colliers with wide atrophic noses.—*Experiences of the Refractories Industries (Silicosis) Scheme, 1919, C. L. Sutherland and W. C. Rivers, Tubercle, March, 1923, iv, 255.*

Artificial Pneumopericardium.—A serofibrinous pericarditis, which developed during the slow course of a tuberculous polyseritis, was treated by subxiphoid punctures and injections of nitrogen. The effusion was resorbed, leaving only a pericardial adhesion, that was borne perfectly well, and no sternocostal adhesions. As a complication of this condition a hemiplegia existed during the time of the pericardial effusion. This was probably independent of the paracentesis, but related to organic lesions in the gray nucleus which were perhaps of embolic origin.—*Pericardite sero-fibrineuse; pneumo-pericarde artificiel; symphyse consecutive. L'hémiplégie pericardique, Troisier, Jacquelin and R. Gayet, Meeting, Société Médicale des Hôpitaux, February 9, 1923, reported in Presse Méd., February 14, 1923, no. 13, 148.*

Foreign Bodies in Bronchi Simulating Tuberculosis.—In two cases of foreign bodies in the bronchi, for 5 and 15 months, respectively, the subjects were considered tuberculous up to the time that the true cause was revealed by the radioscope.—*Corps étranger intrabronchique simulant une bronchite chronique, F. Lemaitre, Meeting, Société Médicale des Hôpitaux, February 2, 1923, reported in Presse Méd., February 7, 1923, no. 11, 125.*

Tuberculosis Anergy Caused by Syphilis.—Many clinical facts suggest that, in certain conditions, syphilis renders its subjects less resistant to tuberculous infection. By way of testing this possibility tuberculin skin tests were made upon 63 syphilitic adults, all of whom might be expected to give positive reactions had they been in a state of normal health. Of these 63 cases there were 40 with secondary syphilis. In 20 of these the skin test was completely negative, and in 8 it was nearly negative. The intensity of the tuberculin reaction is influenced by the development of syphilis. It begins to diminish at the time the Wassermann reaction appears and decreases up to the time when the syphilitic infection is at maximum intensity. In untreated syphilis the reaction remains negative up to the disappearance of the rash. It is influenced by antisyphilitic treatment, reappearing in two to four weeks in well-treated cases of syphilis. In syphilitic patients with tuberculous stigmata (lymph node scars) the skin reaction remained negative longer than in other patients.—*Syphilis et tuberculose: l'anergie syphilitique, M. Lelong and E. Rivalier, Compt. Rend. Soc. d. Biol., February 10, 1923, lxxxviii, 327.*

Influence of Tuberculosis on Experimental Scurvy.—Tuberculosis in guinea pigs fed on deficient diets does not accelerate the evolution of scurvy nor does it tend to induce scurvy when the diet is appropriate. The scorbutic lesions seemed a little less severe in the tuberculous than the non-tuberculous animals.—*Effets de l'evolution d'une infection par le bacille de Koch sur la marche du scorbut expérimental du cobaye, Mouriquand, Michel and Bertoye, Reunion biologique de Lyon, July 3, 1922, reported in Compt. Rend. Soc. d. Biol., July 15, 1922, lxxxvii, 537.*

Occult Blood in Feces of Anemic Tuberculous Patients.—Masuda carried out the test for latent hemorrhages in the feces on 100 cases of phthisis. He found 13 negative and 87 positive cases, and concludes that even among patients who are entirely free from intestinal parasites and apparently free from intestinal tuberculosis involvement, there occur cases that have a remarkable anemia among tuberculous patients.—*On the Latent Hemorrhages of*

Anemic Tuberculous Patients, I Communication, T. Masada, Kekkaku Zassi, June, 1922, iv, no. 12, Abstract from Japan Medical World, November, 1922, ii, 323.

Intrathoracic Neoplasms.—Malignant disease within the chest is becoming more common. Evidence is accumulating to show that such disease may have its origin in certain inflammatory conditions, such as influenza, bronchiectatic cavities, tuberculous cicatrices and pneumokoniosis. The incidence is greatest in males over forty years old. Right-sided involvement is more common. Primary cancer, as described by Pfahler, may be of the sharply defined nodular type at the hilum, or of the infiltrating type spreading outward and upward from the hilum along the bronchial tree; metastases occur in the lymph nodes, liver, and sometimes in the bones and other organs. Primary sarcoma spreads outward, usually about the median fissure on the left, or the median lobe on the right. Secondary sarcoma is most often seen with sarcoma of the testis; metastases of hypernephroma are also frequent. In typical cases of malignant disease the diagnosis is based on slow onset, with dry cough and slight sputum, later sanguinous, and, still later, frankly bloody and gelatinous. As the disease advances there is pain, fever in half the cases, loss of flesh and physical signs of varying character. Palpable lymph nodes about the neck and axillae are suggestive, and the withdrawal of a bloody exudate from the pleura establishes a presumptive diagnosis. Roentgen and histological examinations may clear up the diagnosis. Pain and dyspnea are uncommon in early tuberculosis, but common in cancer. The nodules shown upon the X-ray plate in miliary distribution of cancer are larger and more dense than those of tuberculosis. Syphilis, leukemic infiltration, Hodgkin's disease, empyema, pleural effusion and aneurysm must be differentiated. In the average case of such malignant disease, the patient dies in twelve to eighteen months, but certain cases, especially spindle-cell sarcoma, may last five years. Malignant disease of the pleura is commonly unilateral. Symptoms include pain, cough, dyspnea and loss of weight; usually no fever or expectoration. Bloody or yellowish serous fluid may be withdrawn on aspiration; needle track metastases may occur. The pleura is thick and casts a very dense shadow by X-ray. The heart is permanently displaced, and usually symptoms are not relieved by aspiration of fluid. Secondary malignant disease of the pleura is more frequent, the source being generally cancer of the breast, stomach or mediastinum. Malignant tumors of the mediastinum arise primarily from mediastinal lymph nodes, or the thymus, or occasionally from an aberrant thyroid. Sarcoma is most frequent. Lymphosarcoma, Hodgkin's disease and leukemic growth are not infrequent. Secondary growths are common from any neighboring malignant affection. The symptoms are those of pressure rather than of invasion of neighboring tissues. As a rule tumors in the anterior mediastinum are sarcomatous, those in the posterior space being commonly tuberculous, especially in children. Dermoid cyst can rarely be diagnosed except by shadows of teeth, or if sebaceous material and hair should be coughed up. Mediastinal malignancy is usually fatal in from six to twelve months.—*New Growths within the Chest, J. N. Hall, Amer. J. Roentgenol. & Radiol. Therap., March, 1923, x, 182.*

Staphylococci in Throat.—A review of literature on the rôle that the staphylococcus plays in acute conditions of the upper respiratory tract shows that this microorganism is commonly but not always present in this region in normal persons; that it is rarely capable of producing uncomplicated respiratory conditions; and that it is probably an opportunist, becoming active as a complicating factor or secondary invader. Staphylococci were grown from the nasopharynx and throat in a higher percentage of persons with common colds than that of normal persons. The latter show a higher percentage of Staphylococcus aureus than the former. There was no marked distinction in the biochemical reactions between the staphylococci from persons with colds and those from normal persons, except that mannite was more commonly fermented by strains from the normal source. Staphylococci showed remarkably similar reactions in the tests employed, there being no group peculiar to the condition of colds. An attempt at classification revealed great variations. Chromogenesis, although often an unsatisfactory basis, was decided as, on the whole, the most practical. On this basis there were found the golden, the white, the lemon yellow and the colorless groups. Staphylococcus aureus was the most active in producing biochemical changes, Staphylococcus albus next less active, the colorless group next and Staphylococcus citreus the least active. Serological tests were insufficient as a means of correlating members of chromogenic or fermentation groups. The view is favored that the staphylococci belong to one generic group, that they can logically be subdivided on the basis of chromogenesis and that Staphylococcus aureus

represents the main type from which Staphylococcus albus and Staphylococcus citreus have varied in chromogenic and cultural powers.—*The Incidence and Classification of Staphylococci in the Throats of Normal Persons and of Persons with Common Colds. Influenza Studies. XII, N. P. Hudson, J. Infect. Dis., April, 1923, xxxii, 297.*

Lung Abscess.—A series of 23 cases is reported, 13 of these being postoperative. Lung abscess occurs most frequently in middle life and affects males three times as often as females. It has been noted in other studies that an antecedent tuberculosis predisposes to a frank lung abscess. Postoperative abscesses seem to be less serious than those of other origin. With a post-tonsillectomy abscess a delay of treatment for several months after the disease has become established is not necessarily prejudicial to cure. Conservative treatment, including postural drainage, good food, hygienic surroundings and antiseptic inhalations should be tried first; if this will not tide a patient over the acute stage of the disease, operation is not likely to do so. When the process becomes chronic under conservative treatment operative drainage is the only measure likely to prove curative. In cases of various etiology other than postoperative the same general rule of treatment applies. Operation during the acute stage in septic patients is usually fatal. Operative technique is discussed and a trial of artificial pneumothorax treatment where adhesions do not interfere is favored. *Conclusions:* 1. The distribution of abscesses of the lung among the pulmonary lobes is similar to that of other acute pulmonary affections. 2. The right lung, and especially the right lower lobe, is chiefly involved, whether the process is abscess, pneumonia or embolism. 3. The preponderance of right lobe disease is due to some extent to the greater size of the right lung, but more to the greater exposure to wear and tear of the right bronchial tree. 4. Postoperative abscesses, particularly those which follow operations on the tonsils and teeth, occur more often in the upper lobes and less often in the lower lobes than do other pulmonary affections. 5. This tendency suggests that immediate aspiration from the mouth and throat is less of an etiological factor than has generally been believed. 6. Postoperative abscesses are not infrequently cured by postural drainage and general hygienic measures. They should not be subjected to operation until it is demonstrated under close observation that cure by nonoperative means is unlikely. 7. The precautions which should be taken against the occurrence of postoperative abscess should include not only those usually employed against inhalation (the abolition of ether anesthesia for tonsillectomy or tooth extraction when infection is present in the mouth or throat), but the same precautions against lowering the resistance of the patient which are employed to prevent the occurrence of postoperative bronchitis and pneumonia.—*The Etiology and Clinical Features of Lung Abscess, J. Homans, Boston M. & S. J., April 19, 1923, clxxxviii, 577.*

Nontuberculous Pulmonary Abscess.—These cases should not be left to be operated on only as a last resort. There is a time in nearly every case when operation would be fairly safe, but if left until the patient is gravely ill it is likely to hasten his death. The 86 cases on which this report is based range over five or six years, and were mostly at the Massachusetts General Hospital. The diagnoses were all made after careful consideration and cooperation. Lung abscess should be clearly differentiated from bronchiectasis, in which drainage never has more than a palliative effect, if any. *Etiology*: In this series of 86 cases, 61 per cent were directly preceded by some operation on the upper respiratory tract done under a general anesthetic, and 40 per cent of all of them followed tonsillectomy. These cases are probably due to aspiration of septic material, even where the abscess is in the upper lobe, as cough may force it into the upper lobe bronchus. The next most common cause is bronchopneumonia (13 cases). Abscess rarely follows lobar pneumonia. *Age:* The vast majority of cases occur between the ages of twenty and forty. *Situation:* In 72 cases at the Massachusetts General Hospital there were 43 abscesses situated in the upper lobe, 29 in the lower. These figures vary considerably in different clinics. In 1919 Hedbloom reported 48 cases from the Mayo Clinic, 32 of which were in the lower lobe. Autopsy records at the Massachusetts General Hospital show that in the majority of cases the abscess was peripherally situated (29 out of 30) and the lung and pleura adherent (30 out of 35). *Diagnosis:* A careful history will point very strongly to the correct diagnosis. In most cases of lung abscess the start of the process is an acute condition, while in bronchiectasis the onset is slow and gradual. The sputum should be carefully and repeatedly examined by an expert before operation is undertaken. When one kind of microörganism only is present this evidence favors an empyema which has ruptured through a bronchus. Predominance of influenza bacilli suggests

bronchiectasis. The X-ray may be said to be the most important examination and in all cases it localizes the process more accurately, this being of the greatest value to the surgeon. The physical examination is frequently a disappointing one, and occasionally there are no abnormal physical signs. Abscess of the lung should be differentiated from tuberculosis, bronchiectasis, bronchopneumonia, malignant disease, perforating empyema and benign tumors. *Operation:* If the sputum is not foul or excessive and there is no evidence of sepsis, operation need not be done immediately. Cases in which the abscess is near the periphery are more favorable than when deeply situated. In delaying operation there is always some risk of general sepsis and brain abscess. There is a difference of opinion as to the proportion of cases that recover spontaneously, ranging from over 50 per cent (Lockwood) to 7 per cent (Lord). The lowest reported operative mortality is 9 per cent of 62 cases (Lord), while of the present series the operative mortality was 15 per cent. Convalescence is long drawn out and it is necessary to plan to continue drainage. At the Mayo clinic the average duration of hospital treatment was 44 days and of disability to work 13.75 months. *Operative technique:* Local anesthesia is the choice, and gas-oxygen next best. Local anesthesia may include local blocking of the intercostal nerves at the site of operation, or paravertebral anesthesia; the latter gives brilliant results and permits operation as under a general anesthesia. The old two-stage operation is safest: a window is first opened in the chest wall down to the pleura; then the lung and pleura are made adherent either by suture or, more safely, by gauze packing; at the second stage the abscess is opened and drained. When a single-stage operation is done, 50 per cent of cases will be complicated by empyema. There are two proofs of finding the abscess: (1) escape of actual pus; (2) a blast of foul air. If this area is drained, pus will come out within 24 hours. The best form of drainage is with a very soft rubber tube surrounded by gauze. The abscess cannot be regarded as cured until the cavity is entirely obliterated, and the only way this can occur is by scar tissue formation which is protracted. *Conclusions:* 1. Many cases could be avoided by better technique in operations about the nose and throat. 2. It is generally possible to make a diagnosis before operation. 3. If there is no improvement in three or four weeks operation should be considered. The prognosis is better if surgery is not delayed until the condition becomes chronic. 4. The mortality will vary according to the kind of case. 5. It seems fair to give each patient a chance for cure by postural drainage and general measures before resorting to operation. But if at any time the condition ceases or gets worse operation should be performed.—*Nontuberculous Pulmonary Abscess, W. Whittemore, Boston M. & S. J., April 5. 1923, clxxxviii, 496.*

Tuberculosis Serum Reactions during and after Typhoid Fever.—Arloing and Courmont found that the serum of typhoid fever patients almost always agglutinated tubercle bacilli, but that the agglutination titre did not correspond to the agglutination titre for the typhoid bacillus. It seems probable that agglutination of tubercle bacilli does not depend on the agglutination of typhoid bacilli but that it is due to latent tuberculous lesions coexisting with typhoid fever, and that the agglutinating power which is specifically tuberculous has been exalted by a nonspecific febrile process. If this is the case, the serum reaction should vary with the different phases of the fever. To test these possibilities both fixation and agglutination reactions were studied in subjects with typhoid fever, with and without manifestations of tuberculosis. The results showed that between the specific typhoid agglutination and the tuberculous antibody reactions there was no relation and that no constant relation existed between agglutination and fixation reactions of tuberculous serum. In half of the cases these reactions were parallel, in the other half they showed very distinct divergences, both in cases of pure typhoid fever and those complicated with tuberculosis. In 9 cases in which tuberculosis probably existed there was always agglutination, almost always very marked and generally increasing during convalescence. In these cases there was marked deviation of complement only 4 times, very slight deviation 2 times, no deviation 3 times. In 8 cases in which tuberculosis appeared not to exist both agglutination and deviation were negative or extremely slight 4 times and were both positive 4 times. In these 4 positive cases, deviation, very marked during the acute phase, became very weak during convalescence; agglutination was moderately great, and remained constant in 3 of them. Agglutination is a more delicate indicator of slight tuberculous lesions than complement fixation; the former was constantly positive in cases of suspected tuberculosis.—*Résultats comparées des séro-réactions tuberculeuses (agglutination du bacille tuberculeux et réaction de deviation du complement) au cours et dans la convalescence de la fièvre typhoïde, P. Courmont and A. Dumas, Compt. Rend. Soc. d. Biol., December 23, 1922, lxxxvii, 1394.*

Symptoms Influencing Prognosis of Pulmonary Tuberculosis.—This analysis is based on a study of 980 cases admitted to the Trudeau Sanatorium from 1907 to 1913. The condition of more than 98 per cent of these patients was known in 1918. The mode of onset, whether catarrhal, insidious, pleuritic, hemoptysic or febrile, had little or no part in determining the future course of the disease. Of those cases showing tubercle bacilli in the sputum, 53 per cent were well and working as contrasted with 79 per cent of the bacilli-negative cases; the mortality among the positive cases, five to eleven years after discharge, was 32 per cent as compared to 6 per cent among the negative cases. Of the patients who had hemoptyses of one teaspoonful or more, 61 per cent were well and working as compared with 65 per cent of the nonbleeding patients; the death rate was 23 and 22 per cent, respectively. Among those who gained weight, 67 per cent were well and 20 per cent were dead, as compared with figures of 57 and 27 per cent, respectively, among those who lost weight; when the weight remained stationary the patients did no better than those who lost. Tachycardia, evidenced by a pulse rate of 90 or over, persisting for five consecutive days, was found to be of grave prognostic significance. Cases were classified as "fever positive" when the temperature was 99.5°F. or over for five consecutive days. Among the febrile patients, 43 per cent were dead and 45 per cent were well, while among the afebrile patients, 68 per cent were well and 17 per cent had died. Regarding influence of sex it was found that 63 per cent of the males and 65 per cent of the females were well, while the death rates were 25 and 18 per cent, respectively. A history of tuberculosis in the immediate family had no prognostic value. Seventy-eight per cent of the incipient cases had resumed normal life, while less than 10 per cent had died; 70 per cent of the moderately advanced cases were alive, but only 57 per cent were working; 25 per cent of the far advanced cases were well. Of all the 980 patients, 214 were dead and 11 unknown. Of the deaths, 84 per cent were caused by tuberculosis; the remainder by other causes. Seventy-five per cent of the patients are well or living from five to eleven years after discharge, while practically two out of every three of them have been restored to earning capacity.—*Influence of Various Symptoms in the Prognosis of Pulmonary Tuberculosis, F. B. Trudeau, J. Am. M. Ass., March 24, 1923, lxxx, 831.*

Prognosis of Spontaneous Tuberculous Pneumothorax.—The general pessimism regarding spontaneous pneumothorax is not entirely warranted. Simple closed pneumothorax offers the best prognosis and very often even leads to improvement of the pulmonary condition by compressing the diseased lung. The "ventil-pneumothorax" (valvular pneumothorax) offers a cautious prognosis. The two dangers connected with it are the excessive compression of the lung with its dire effect upon the heart and the increased danger of a pyopneumothorax.—*Über den tuberkulösen Spontanpneumothorax, G. Barth, Ztschr. f. Tuberk., January, 1923, xxxvii, 321.*

Prognostic Value of Leucocyte Count in Tuberculosis.—In the majority of clinically favorable cases the lymphocytes are increased. Increase of neutrophiles is observed in unfavorable cases. The proportion between the neutrophiles and the lymphocytes should be regarded as an expression of the general reaction to the tubercle bacillus.—*Das prognostische Wert des weissen Blutbildes bei Lungentuberkulose, K. O. Rosenthal, Deutsch. med. Wchnschr., February 23, 1923, xlix, 249.*

Prognosis of Cavities in Pulmonary Tuberculosis.—The prognosis of a cavity depends upon its size, the number of intercommunications and the form of the phthisis occasioning it. The greater the number and the larger the cavities the more unfavorable the prognosis. With regard to the danger of hemorrhage, the number and size of the cavities give no information of value. The more granular and rapidly liquefying masses the cavity contains the greater the danger of spread of infection to healthy parts, and this is especially true when the cavity communicates with a bronchus. Cephalad cavities tend to give rise more frequently to the aspiration of bacilli to parts lower down; this aspiration danger increases with hemorrhage. If the cavity extends to the pleura, the danger of rupture increases. Cavities tend to cause laryngeal and intestinal disease. Large cavities rarely heal anatomically, or clinically. Pneumothorax therapy and thoracoplasty are the best methods of healing cavities.—*Die prognostische Bedeutung der Kaverne bei der Lungenphthise, De la Camp, Beitr. z. Klin. d. Tuberk., March, 1922, l, 281.*

Prevention of Phthisis in Printers.—Printers in unclean shops breathe in considerable silica, but in shops where adequate elimination of dust occurs this possibility is removed. Ross has related an experiment that is of interest. Two large London printing establishments, each with persons

of all ages and neither with picked population in its employ, one with suction apparatus adequate to remove all dust from the shop, the other without such apparatus, were "used" in the experiment. Careful medical notes and records were made for two years of all cases of sickness occurring in the employees of each shop. No new case of tuberculosis developed in the suction-cleaned, dust-free factory in the two-year period, while in the first year in the other factory there were five new cases, one going on to death. At the end of the first year, this factory was "extracleaned" and no case of phthisis appeared the second year. Dust may be a causative factor in many other diseases and its elimination from factories is highly desirable.—*The Prevention of Phthisis among Printers, Editorial, N. York M. J., 1923, cxvii, 368.*

Work of London Metropolitan Asylums Board.—Since the establishment of this board fifty-six years ago, its work in providing and managing institutions for the treatment of the sick has expanded very rapidly until now it is the principal institutional authority in London, and manages about forty institutions containing over 20,000 beds. The accomodations afforded for the care of various forms of tuberculosis are described. These include 900 beds for "surgical" tuberculosis, and 1,280 beds for pulmonary cases.—*The Tuberculosis Work of The Metropolitan Asylums Board, J. Watt, Brit. J. Tuberc., April, 1923, xvii, 69.*

Work of Welsh National Memorial Association.—In Wales the tuberculosis work is entrusted to a national organization, centralizing and coördinating the activities of all the tuberculosis physicians throughout the principality and providing accomodation in residential institutions for those patients who require it on a national instead of a local basis. Reference is made to the two main sanatoria for North and South Wales, respectively, situated at Llangwyfan in Denbighshire, and at Talgarth, close to Brecon, and illustrations showing the layout of these institutions are included. In Wales, there is a prevalence of an acute progressive clinical type of tuberculosis affecting, as a rule, adolescents and young adults, and far advanced cases of chronic disease are also numerous, thus necessitating a large number of residential institutions. The methods that have been followed in securing institutional facilities are described; in most cases existing buildings have been purchased and converted, this proving to be the most economical plan. In cases of surgical tuberculosis, provision is made for special follow-up work after discharge from the sanatorium, in this way insuring proper repair and revision of the patient's means of support. All tuberculosis physicians and medical superintendents meet once every quarter to discuss their problems and outline any investigation that is to be undertaken collectively. The central laboratory of the association, located in the Welsh National School of Medicine at Cardiff, is associated with the Tuberculosis Department of the David Davies Professor of Tuberculosis, and the two organizations work as one in relation to research. Additional installations of X-ray plants are being made in a number of institutions.—*Recent Developments in the Work of the Welsh National Memorial Association, S. L. Cummins, Brit. J. Tuberc., April, 1923, xvii, 59.*

Lessons from Framingham Tuberculosis Experiment.—At the start of this experiment six years ago the following objectives were aimed for: 1. To determine the tuberculosis incidence in the normal American community. 2. To discover the best means for the detection and treatment of tuberculosis. 3. To test the worth of widely used control measures. 4. To develop in conjunction with tuberculosis work a reasonably adequate general health program. 5. To ascertain the cost of such a program and the community's attitude toward it. The chief measures adopted included a thorough medical examination of most of the population, the encouragement of the community to undertake health and disease prevention work, the establishment of a consultation service for practising physicians, a continuous hygienic educational campaign, and an effort to organize health machinery around existing agencies. The practicability of the scheme, as leading into the great unoccupied field of the private practice of preventive medicine, has been shown. The more important results of the experiment are as follows: 1. The ratio of known active tuberculosis cases to tuberculosis deaths was increased during the first year of the demonstration from three to one to nine to one, indicating that in many communities from one-half to two-thirds of the active cases are undetected. 2. The average annual number of tuberculosis cases reported increased from 13 to 39 during the first three years. 3. The percentage of early cases discovered increased from 45 to 83 per cent in the first three or four years. 4. The percentage of cases sent away to hospitals or sanatoria increased during the first three years from 15 to 42 per cent. 5. The tuberculosis death rate for 1921, the fifth year of the demonstration, represented a

reduction as compared with the predemonstration decade average, of 67 per cent; there was an improvement of 8 per cent for similar towns in Massachusetts. If the last three years of the demonstration (1919–1920) are averaged and compared with the preceding decade, the Framingham improvement is 46 per cent as compared with 3 per cent for the comparative, so called "control" towns. 6. The town of Framingham was spending approximately forty cents per capita per year for health work at the time of the demonstration initiation; it now carries a health expenditure of about $2.30. It appears that a practically complete health and tuberculosis program will cost something in the neighborhood of $3 per capita per year, that the typical American community is both willing and able to meet adequately its health obligations, and that public health when purchased in reasonably liberal quantities is a more than worth while investment. —*Indications from the Experience of the Framingham Tuberculosis Experiment, D. B. Armstrong, Boston M. & S. J., March 29, 1923, clxxxviii, 433.*

Antituberculosis Work of Rockefeller Commission in France.—The Rockefeller Foundation began its antituberculosis work in France in July, 1917, working through the International Bureau of Health. The first aim was to stimulate public interest in hygiene, through instruction concerning tuberculosis, and thereby to lead to public measures for its control. To this end assistance was given to departmental organizations and to the creation of dispensaries. The work was done in coöperation with the Bureau of Tuberculosis of the American Red Cross. In October, 1921, the Foundation had expended six and a half million francs, and the Red Cross six million francs. In 1917 there were in France 10 tuberculosis dispensaries with no visiting hygienists, and but one school for the instruction of visiting hygienists; in January, 1922, there were 350 dispensaries, of which 250 had at least one visiting hygienist, 8 schools had been founded for their instruction and 65 departmental associations were at work. The effect upon public opinion was so great that municipal and other councils have since 1920 appropriated twenty five million francs for the fight against tuberculosis, a sum which is exclusive of hospital and sanatorial aid; the National Committee of Defense against Tuberculosis has also become a powerful factor. The manner in which the work has been accomplished as well as its splendid and fruitful results are deserving of unstinted praise.—*La Commission Rockefeller en France, P. Tessier, Rev. d. l. Tuberc., December, 1922, iii, 565.*

Tuberculosis in Porto Rico.—The laboring classes in Porto Rico suffer greatly from tuberculosis. The tuberculosis death rate is a little more than 200 per hundred thousand, or greater than that of any State in the union except Colorado. In Porto Rico, moreover, the tuberculosis death rate of the well-to-do classes is very much lower than that of the laboring classes. In the industrial cities on the practically level coast belt it averages about 8 per cent of the total death rate; in the mountainous central portion it is less, averaging about 4 per cent, except in certain industrial towns, especially those dependent on the tobacco industry. The death rate for industrial women is higher than that for men. This condition is the exact opposite of that in the United States, and is supposed to be due to the fact that in Porto Rico industrial women are also wives, mothers, and housekeepers. These high rates are not due to the climate, which is both delightful and healthful, but to the conditions under which the poorer classes live. A survey of more than a thousand houses occupied by the laboring classes in seven of the larger cities on the island reveals that practically all of them consist of two rooms, and shelter an average of six persons. Each room has an average floor space of less than 100 square feet; and the total air space is considerably less than 10,000 cubic feet. As the one window and the door are kept closed all night long to keep out the greatly dreaded "night air," this 10,000 cubic feet has to suffice for three persons for about eight hours. As Rosenau estimates that to keep healthy a man weighing about 160 pounds requires about 2,400 cubic feet of fresh air, renewed every hour, the state of air in these rooms after being occupied all night by three persons may be imagined. Such conditions are, of course, ideal for the transmission of tuberculosis. The usual diet of the people for the most part is also ideal for the propagation of the disease. Black coffee, rice and beans in great quantities, and sometimes bananas, oranges, and plantains complete the list. Both the housing and the diet are due chiefly to the prevailing economic conditions. A wage of thirty cents to one dollar per day (generally fifty cents) makes it impossible for the laborer to support his family, to furnish habitable homes, and to purchase adequate food. Employers say that the average laborer does not do enough work to entitle him to higher wages; and this may be admitted. But the laborer cannot do better work, because he suffers not only from tuberculosis, but also from hookworm and malnutrition. He cannot afford to do what his doctors advise, and in consequence he cannot give his employer better labor. This

vicious circle can be broken, but it has not yet been. A comparative check by name of all the reported cases and reported deaths from tuberculosis in Porto Rico during the last 2½ years showed that 60 per cent of the tuberculosis deaths were never reported as cases. In other words, more than one-half of the death reports supplied the first official intimation that the patient had been ill at all. The illness is probably concealed as long as possible, sometimes until death, and in many of the reported cases until the patient was in a moribund state. Most Porto Rico cities employ physicians who hold clinics for patients at convenient places and who later visit patients who are unable to come in person. More of these clinics are recommended. Other recommendations are for the establishment of social work, the supplying of free sputum cups, better reporting of cases, increased hospital accomodations, education of children along health lines, and the working out of a wage scale that will give the laborer a chance to preserve his own life and the lives of his family. The great mass of the workers of the island are employed in the sugar, tobacco, fruit raising, and coffee industries.—*Tuberculosis in Porto Rico, Health News, Bulletin issued by U. S. P. H. S., May 31, 1923.*

Tuberculosis in India.—Tuberculosis is increasing in many parts of India, especially presidency capitals, great industrial and commercial centres, and the large towns, and appears to be extending to rural areas. From careful calculation, the annual mortality could not be less than a million, one death in every ten being due to tuberculosis, and in many Indian cities one out of every three adult deaths is due to consumption. Three important causes are insanitation, malnutrition and overcrowding. The sanitary and housing standards are very low. There is widespread poverty among the masses, and millions live in a state of chronic want and starvation, succumbing in thousands to any prevailing disease. Overcrowding in principal towns and cities like Bombay is so great and rent so high, that even some of the middle classes and humbler Anglo-Indians live in cheap lodgings and tenement blocks. In certain parts of Lahore 465 persons are crowded in an acre, in Cawnpore 563 and in Bombay 638, while in the worst parts of a city like Leeds it is only 104, and in Birmingham 101. Under the joint family system accomodations are more and more limited and sanitary arrangements hopeless. Especially the inner part of the houses where purdah women reside lacks light and fresh air. The more the purdah system is enforced, the greater the tuberculosis mortality, as among Mohammedan women; the less it is observed the less the mortality, as among the Burmese women. Bovine tuberculosis is rare in India, as most children are breastfed, and when fresh milk is used it is always boiled. The social habits and customs of the Indian people have favored the spread of tuberculosis. Also heat intensifies its progress. Added to these factors is a poor or ill-balanced diet, while malaria also adds fuel to the disease. The indiscriminate spitting of the careless consumptive helps in its dissemination. Any remedies to accomplish anything must be based on improving sanitation and the standard of nutrition. The establishment of open air sanatoria under expert supervision is most important, as there are at present only five or six for the entire 319 million population. Far-reaching social and economic measures must be adopted, such as better wages, improved housing, planting of garden cities and colonies, and diversion of migration from the town into the country, together with the teaching of elementary hygiene in the schools.—*Some Impressions of Tuberculosis Problems in India, C. Muthu, Brit. J. Tuberc., July, 1923, xvii, 118.*

Relation between Practising Physician and the Tuberculosis Dispensary.—The dispensary, in its own interests and those of the practitioner, should strictly eliminate from dispensary care all cases not really tuberculous. It can render a service to the practitioner by returning these patients to him with the more correct diagnosis which its equipment and its personnel enable it to make. The practitioners on their side should not desire to assume the functions of the dispensary which ought to be directed by a specialist in tuberculosis.—*A propos des rapports entre les dispensaires antituberculeux et les médecins practiciens, Le dispensaire organe de diagnostic, A. Martin, Presse Méd., June 30, 1923, no. 52, 1085.*

Ideal Tuberculosis Research Worker.—This is a discussion by a layman, who has tuberculosis, of the inadequacy of the present tuberculosis program. He portrays what he considers the type of man needed to attack the scientific side of the problem and indicates the manner in which he must work.—*The End of the Tether? An Open Letter on Tuberculosis to a YoungMedical Man, By an Ex-University Lecturer, Brit. J. Tuberc., April, 1923, xvii, 82.*

Combating Tuberculosis in Children.—At the International Conference of July 11–13, 1922, at Brussels, Dr. Fergus Hewatt, representing the United States of America,

insisted on the importance of studying the skin reaction systematically. The subject of a positive reaction should undergo an exhaustive clinical examination, with a view to placing the child in suitable conditions and to inspecting its environment for sources of infection. The report from Great Britain described a grouping based upon the practice of the Royal Victoria Hospital at Edinburgh, by which infected children are placed in the three following categories: 1. Those with positive skin reaction, but apparently healthy, for whom there is prescribed only an open air life. 2. Those with positive skin reaction and general signs, but without pronounced local lesions, for whom fresh air schools, or in some cases preventoria, are prescribed. 3. Those with positive skin reaction and symptoms of local lesions for whom treatment should supersede instruction. The fresh air school movement is gaining in Great Britain, but better results demand a permanent association between clinicians and the fresh air school organizations. Statistics in Great Britain show a relatively high mortality from tuberculosis before and after the close of the school age. The total mortality has fallen off rapidly during the past twenty years. The detection of tuberculosis during the school period is not only advantageous for the child, but it furnishes the means of studying obscure points concerning infection. Dr. Heitman reported from Norway that in a city formerly ridden with tuberculosis the mortality during childhood had fallen off 50 per cent, a decrease which was due to obligatory declaration and isolation; isolation from tuberculous mothers is practised from birth to three years; family placement does not exist. Dr. Pio Toa reported from Italy that efforts there were directed toward the education of the child and, through it, to education of the parents. Doctors Armand-Delille and Granjux described the results of the Grancher movement in France. In 18 years it has placed 2,450 children among whom there have been only 7 cases of tuberculosis. Dr. Leon Bernard offered the following resolution which was adopted: "This Conference, confirming the experimental and clinical facts which demonstrate that infecton is exclusively responsible for tuberculosis in childhood, and that heredity plays no part in it, calls for both public and private support of its efforts for prophylaxis and of the different means of realizing prophylaxis, namely: 1. Education through the dispensary and through the visiting nurse. 2. Medical inspection of schools. 3. Collective placement in preventoriums of children slightly affected and not contagious. 4. Family placement whenever possible of healthy children in contact with infection; for older children in centres of the Grancher type; for nurslings in centres equipped for oversight of the care and feeding of infants."—*La lutte contre la tuberculose a l'age scolaire.—La Conference Internationale contre la Tuberculose, Brussels, July 11–13, 1922, Reported in Rev. d. l. Tuberc., December, 1922, iii, 585.*

Etiology of Tuberculous Infection.—A detailed review of all recent theories on the etiology of tuberculous infection.—*Über die Infectionswege der Tuberkulose, H. Beitzke, Ztschr. f. Tuberk., March, 1923, xxxvii, 401.*

Intrauterine Tuberculous Infection.—An infant died twenty days after birth, with miliary pulmonary tuberculosis at postmortem and caseation of the hilum lymph nodes. The spleen and liver were clear. The mother died forty-nine days later. Besides widespread pulmonary and intestinal tuberculosis, she was found to have tuberculosis of the uterus and tubes at autopsy. Aerogenic infection of the infant is considered to be excluded in this case. Pure pulmonary disease is possible in intrauterine transmission, as well as in other infections. An absence of tuberculosis of the liver does not exclude the possibility of an intrauterine tuberculosis infection.—*Über intrauterine Tuberkuloseinfektion, R. Käckell, Beitr. z. Klin. d. Tuberk., June, 1922, lii, 46.*

Droplet Infection and Tuberculosis.—*Polemic:* Flügge finds nothing new in Seiffert's method for demonstrating droplets, that is, the blue coloration developing when droplets fall on paper impregnated with ferrous sulphate and rubbed with blood alkaline salts, and points out that all droplets whether from mouth, throat or bronchi, react similarly. Seiffert's contention that dried droplets are a danger is also incorrect, for the total number of bacilli in such minute masses is negligible compared with the number in pieces of sputum of similar size. Flügge believes Seiffert's precautions in the way of washing and sterilization of objects upon which droplets have come to rest, wholly unnecessary. Seiffert, on the other hand, feels that his results only support Flügge's own theories. Admitting that the type of droplet cannot be distinguished, he emphasizes the value of his method for the measurement of size. Dried droplets may not contain as many bacilli as dried sputum, but coughing is more frequent than expectoration, and bacilli are distributed over a far wider area. His precautions with respect

to furniture and other objects may not effect complete sterilization, but the number of bacilli is greatly reduced.—*Hustentröpfchen und Tuberkuloseinfektion. Erwiderung auf den Aufsatz von Dr. G. Seiffert (München. med. Wchnschr., no. 28, 1922), C. Flügge. Gegenaüsserung zu Prof. C. Flügge's Erwiderung, G. Seiffert, München. med. Wchnschr., February 9, 1923, 181.*

Tuberculous Infection through Teeth.—The pulp of milk teeth in two young monkeys was inoculated with bovine tuberculosis, and the cavity sealed to prevent subsequent infection. Local abscesses containing tubercle bacilli soon developed; both animals died five weeks after infection; autopsy showed a generalized miliary tuberculosis without macroscopic lymph node lesions. Six adult rabbits were inoculated, 3 with human, 3 with bovine tuberculosis. Two of the former died soon afterward of non-tuberculous accidents. The four other rabbits died of tuberculosis from three to four months later. Clinical infection, particularly in the spongy vascular pulp of children's teeth, seems a possibility, and in tuberculous persons defective teeth may become channels by which superinfection takes place. Both contingencies emphasize prophylactic measures dependent on the care of the teeth.—*Contribution a l'étude experimèntale de l'infection tuberculeuse a porte d'entrée dentaire, J. Mendel, Ann. d. l'Inst. Pasteur, May, 1923, 537.*

Oral and Conjunctival Routes in Tuberculous Infection.—The authors criticise Flügge's work on producing tuberculosis by the oral route. The success of obtaining positive results by feeding guinea pigs tuberculous material consists not in the dosage but in the technique of feeding. If a few drops of a suspension of tubercle bacilli are placed carefully on the tongue or buccal mucosa of a guinea pig, the dose containing only 8000 to 10,000 living virulent tubercle bacilli, the animal may develop tuberculosis. With a dose of 0.05 mgm., which contains 2 million bacilli similarly applied, one always obtains positive results. The most striking involvement, after this method of infection, shows the deep cervical lymph nodes enormously enlarged, and resembles closely the scrofulosis of children. The same results were obtained in rabbits, except that there is less hyperplasia of the lymph nodes in the rabbit, but more caseation. The lungs and the mesenteric lymph nodes become affected secondarily by the hematogenous route, the authors believe. They ascribe infection of the cervical nodes to the great absorptive properties of the nasopharyngeal mucosa, from which place the absorbed bacilli are carried by the lymphatics to the regional lymph nodes. The same results, as with the oral method of infection, are obtained when the bacillary emulsion is dropped into the conjunctival sac. This mode of infection seems very important from the point of view of practical application to man, as the cough droplets laden with tubercle bacilli may easily land on the sclera and cornea and be washed down into the conjunctival sac. Also, the wiping of eyes with hands contaminated with tubercle bacilli will cause infection. It is very probable that the comparatively large number of scrofulous conjunctivitis cases in children are due to this mode of infection. Besides the cervical nodes involvement, we also find the spleen and lungs involved in these animals. The infection probably occurred by hematogenous route. Guinea pigs infected in this series with 0.01 mgm. do not develop any cervical adenitis, but may develop pulmonary tuberculosis. This last fact speaks for the possibility of conjunctival infection, when the emulsion was instilled. The lungs are, therefore, the easiest place for the tubercle bacilli to develop and pulmonary tuberculosis therefore may originate by the lympho-hematogenic route regardless of the location of the portal of infection.—*Die experimentelle Erzeugung der Halslymphdrüsentuberkulose durch orale und conjunctivale Infection und ihre Beziehungen zu den Erkrankungen der übrigen Organe, insbesondere der Lunge, J. Koch und W. Baumgarten, Deutsche. med. Wchnschr., August, 1922, xlviii, 1096.*

Oral and Conjunctival Routes in Tuberculous Infection.—Findel has shown that the inhalation of only a few tubercle bacilli can produce an isolated pulmonary tuberculosis, while in feeding animals with tubercle bacilli doses one thousand times as large were necessary to infect. The author confirms Findel's statement regarding guinea pigs and rabbits in that, infected by the oral or conjunctival route with 0.25 to 0.025 mgm. of tubercle bacilli, they develop cervical adenitis and a secondary pulmonary tuberculosis. With very small doses, using the conjunctival route, a pulmonary tuberculosis alone, without a definite adenitis, can at times be produced. There is no doubt that the inhalation of bacilli, as demonstrated by Findel, is a method which can occur in the human being under natural conditions, but as a rule the bacilli are absorbed by the nasopharyngeal mucosa through the lymphatics. Therefore, inhalation tuberculosis must be regarded as a result of the absorption of the bacilli from the naso-

pharyngeal and oral mucosae by the lymph and blood vessels, from which they are carried to the lungs.—*Vergleichende experimentelle Untersuchungen über die Enstehung der Lungentuberculose durch Fütterung (orale infection) und Inhalation, W. Baumgarten, Deutsch med. Wchnschr., August, 1922, xlviii, 1126.*

Primary Infection and Reinfection of Lungs.—Primary phthisis is possible at any age, is associated with the danger of generalization resulting from the first infection with tubercle bacilli and is characterized by the appearance of the primary complex. Constitution and disposition, with regard to infection, play no rôle; the possibility of infection, the exposure, only is important. Relative to localization, organ disposition possibly is of great importance; relative to further spread and generalization, the present reaction-power of the body —the total disposition. The result of the primary infection is a relative immunization. Only those develop isolated organ tuberculosis that have passed through a primary infection. In reinfection multiple foci are concerned, that preferably are found in the neighborhood of the apices, in opposition to the primary infection. A characteristic lymph node change is not found. The reparative phases pass through the same stages as the foci of primary infection, probably being slower in development, however. The formation of the nonspecific capsule, consisting of atelectatic edematous lung tissue with pronounced connective tissue increase and pigment deposit, is characteristic of reinfection. The marked differences in the reparative phases of the primary infection and reinfection indicate that both infections lie far apart in time. Endogenous reinfection resulting from contact spread, rupture into the bronchus, lymph or blood stream, the early period of reinfection, plays a more important rôle than exogenous reinfection. Renewed disease in the period of relative immunity, the late period of primary infection and healing of the primary complex, is concerned almost exclusively with an exogenous reinfection. In place of the primary, secondary and tertiary phthisis of Ranke, the periods are divided into the primary effects and the reinfection.—*Über phthisische Primär-und Reinfektion in der Lunge, H. Puhl, Beitr. z. Klin. d. Tuberk., July, 1922, lii, 116.*

Lung Findings in Normal Children.—The practical object of diagnosis is to distinguish between healthy and morbid physical conditions. Knowledge of the latter can evolve only as a corollary of the former. The clinical data for this report were obtained by careful examination of over 200 apparently healthy children between the ages of six and ten years, all children who showed signs of disease being excluded. Correspondingly careful histories were taken and recorded, and a roentgen ray examination and tuberculin test made on every child. After independent roentgenological interpretation, the clinical and roentgenographic findings were correlated. The observations confirmed, in general, the recognized differences in the typical child's chest, such as fuller, higher percussion note, especially over the left lower lobe, and harsher sharper breath sounds, with expiration longer and more distinct, the so called puerile breathing. It should be emphasized that this exaggerated vesiculobronchial respiratory murmur, especially well heard in the areas overlying the great bronchi, is often incorrectly interpreted as evidence of pulmonary disease. However, in an appreciable number of children the percussion note and breath sounds were indistinguishable in character from those of the normal adult chest, and in many instances (over 50 per cent) the roentgen films showed shadows indicative of increased density along the bronchial tree, similar to those seen in the plates of normal adults. On this basis the chests of normal children could often be designated as of the "puerile" or "adult" type. A barely detectable diminution of resonance over the apical regions is of no significance unless associated with a modification of the breath sounds or other abnormal auscultatory findings. The whispered voice sounds normally are loudly transmitted and often syllabation is heard over the region of the major bronchi. D'Espine's sign was found to be of doubtful significance, being elicited in some with no corroborative roentgen ray findings, while in 3 cases with positive roentgen findings it could not be elicited. Slight diminution of resonance in the interscapular region is likewise of doubtful significance. Antecedent healed infections may play a rôle in the production of areas of increased density within the respiratory tract; after measles, pertussis, or tonsillar infections, areas of increased density, radiating from the hilum into the bases especially, often occur. Such lesions are barely discoverable on physical examination and would be unsuspected but for the use of the roentgen ray. The observations indicate that there may be a mild inflammatory process throughout the respiratory passages in a large percentage of the so called uncomplicated cases of these diseases. Such shadows have remained unchanged and without the development of clinical symptoms in a series of children

observed three to five years. A careful anamnesis is necessary, but these minimal infections are often forgotten.—*Some Unappreciated Findings in the Lungs of Normal Children, C. R. Austrian and F. H. Baetjer, Am. J. M. Sci., June, 1923, clxv, 831.*

Empyema in First Two Years of Life.—All statistics show a distressingly high mortality, 60 per cent or more. After the third year this falls to a very low figure. Of 52 cases admitted to Guy's Hospital wards from 1911 to 1920, 13 recovered and 39 died. All of the former and 20 of the latter had been submitted to rib resection drainage. Examination of the histories showed that when empyema alone was present, recovery invariably occurred, and that the deaths were all associated with generalized pneumonic infection preceding and persisting after the empyema. The high mortality in infancy is due to peculiarities of the acute primary pneumonia. It is a favorable symptom when the rise in temperature due to the empyema is separated from and follows after an interval the pneumonic rise. One of the authors, knowing nothing of the circumstances of the cases, was able in nearly every case, by a glance at the temperature, pulse and respiration chart for the first few days, to state whether recovery or death had ensued. Of 34 cases classed as synpneumonic, pneumonia, more or less extensive, was reported at autopsy in 28; acute or suppurative periarditis in 10. There were rarely definite symptoms or signs of pneumonia when the diagnosis of empyema was made. Of the 13 cases who recovered 12 were metapneumonic. No metapneumonic case died. It seems clear that all metapneumonic empyema should be submitted to operation as soon after the termination of the pneumonic process as possible, as delay adds greatly to the risk of fibrosis, bronchiectasis and fistulous communication. On the other hand, synpneumonic cases should not be operated on until the termination of the pneumonic process, but may be relieved temporarily by aspiration or continuous drainage. Conditions are not unlike those in primary pneumococcal peritonitis, when immediate laparotomy is without benefit or is dangerous, the selection of the appropriate time for opening the residual abscess being most important.—*Empyema in the First Two Years of Life, H. C. Cameron and A. A. Osman, Lancet, June 2, 1923, cciv, 1097.*

Nontuberculous Adenitis of Children.—These may result from all the respiratory infections and from congenital syphilis. The chief cause is chronic infection and hypertrophy of the lymphoid tissue of the pharynx. When an adenitis coexists with adenoid growths the reaction to tuberculin is negative 57 times in 100 cases; when adenoids are not present the tuberculin reaction is absent in only 35 cases in 100.—*Les adenites trachéo-bronchiques simples chez les enfants, Nobecourt, Meeting Acad. d. Méd., July 17, 1923, Reported in Presse Méd., July 21, 1923, no. 58, 647.*

Childhood Tuberculosis.—A discussion of all the various manifestations of tuberculosis in children, their symptomatology, diagnosis and prognosis.—*Über die flüchtigen entzündlichen tuberkulösen Krankheitsersheinungen bei Kindern, E. Rüscher, Ztschr. f. Tuberk., January, 1923, xxxvii. 241.*

Frequency of Tuberculous Infection in Childhood.—By means of a comprehensive review and analysis of the statistics of other observers, it is shown that the incidence of tuberculous infection during the period of childhood differs considerably in different European cities. The incidence is apparently much higher in Vienna than in certain other cities, although the reliability of such statistics depends in a large measure upon the method of applying the tuberculin tests. The present study included all the children over one year of age admitted to the children's hospital of Gratz (a city of 150,000 inhabitants), but does not include the individuals in the ambulatory clinic. The tuberculin tests were performed by injecting 0.001 mgm. O. T. subcutaneously, and simultaneously applying the Pirquet test and a modification of the Moro test, in which pure O. T., concentrated by evaporation, is rubbed into the skin of the chest, after making the area of skin "fat-free" by cleansing with ether. If the reactions were negative after twenty-four hours, the test was repeated, injecting 0.02 mgm. tuberculin intracutaneously and the same amount subcutaneously. In the event of a negative reaction again, the tests are repeated with 0.1 mgm. and finally 1 mgm. O. T. The tests were applied to 974 children over one year of age, and, including the clinically tuberculous and tuberculosis suspects, the results were as follows: Between 1 and 2 years, 31 per cent positive; 3 to 4 years, 40 per cent; 5 to 6 years, 46 per cent; 7 to 10 years, 58 per cent; and 11 to 14 years, 71 per cent positive. In this connection, it is interesting to note that up to the fourth year of life the vast majority of children reacting positively showed clinical evidences of tuberculosis, whereas at 14 years only about half of those reacting had manifest tuberculosis. There is a striking difference between the percentage of cases of latent

tuberculosis in Gratz and in Vienna. For example, at 11 to 14 years of age, 94 per cent of the children in Vienna without clinical symptoms react positively to tuberculin, as against only 58 per cent in Gratz. This difference is probably due to the fewer opportunities for exposure to infection in Gratz, a theory which is borne out by the fact that in Vienna tuberculosis causes one-fifth of all the deaths recorded, whereas in Gratz this disease constitutes only one-eighth of the total.—*Zur Haüfigkeit der Tuberkulose im Kinderalter, K. Barchetti, Arch. f. Kinderhk. July, 1922, lxxi, 180.*

Frequency of Tuberculous Infection in Childhood.—Klose studied the school children of Wittenberges, a community of 25,000 inhabitants. The test, performed only once, was a Pirquet test with O. T. and readings were made after 48 hours. The original should be consulted for the detailed figures.—*Ein Beitrag zur Häufigkeit der tuberkulösen Infektion im Schulalter, F. Klose, Beitr. z. Klin. d. Tuberk., June, 1922, lii, 77.*

Pulmonary Tuberculosis in School Children in Charlottenburg in 1921.—An exhaustive study of the incidence of pulmonary tuberculosis in 24,429 school children of Charlottenburg was made, and the findings compared with those of the year 1912, for the purpose of determining whether German war conditions and postwar economic conditions had any effect on the incidence of tuberculosis among the school children. The results of the investigations are summed up by the author as follows: Pulmonary tuberculosis among the school boys of Charlottenburg increased very slightly and among the school girls has not increased at all since 1912. Therefore, it is concluded that the war did not exert any effects on the incidence of pulmonary tuberculosis among the youths of Charlottenburg.—*Die Lungentuberkulose unter den Schulkindern in Charlottenburg im Yahre 1921, Pollchau, Klin. Wchnschr., February, 1923, ii, 264.*

Tuberculous Nature of Epituberculous Infiltration of Lungs in Childhood.—Under the name *epituberculous infiltration* Eliasberg and Neuland have recently described in young children a condition which is characterized by the following clinical findings: Certain children with positive tuberculin reactions and often other manifestations of tuberculosis have an area of massive consolidation in one or the other upper lobe and yet have little or no fever, very little cough and no prostration. The lung findings (dulness and bronchial breathing and only occasionally râles) persist unchanged for many months, but ultimately show regression and resolution of the lesions, coincidentally with improvement of the child. The roentgen picture typical of the condition is a more or less homogeneous shadow in the affected area of the lung, which remains about the same from month to month, but finally clears up, leaving a wide hilum shadow suggestive of enlarged tracheobronchial nodes. Eliasberg and Neuland consider the condition a nontuberculous chronic inflammatory process occurring only in the lungs of tuberculous children. Because of the benign course of the disease, autopsy reports are rare, and those so far reported are unconvincing. The present paper constitutes another autopsy report on a case which had been under careful observation for many months and seemed to fulfill all the requirements for a diagnosis of epituberculous pulmonary infiltration. At autopsy, however, the infiltration was found to be entirely of a tuberculous nature, with here and there small areas of collapsed lung lying between thickly strewn tubercles. It may be that such tuberculous foci can alter the physical signs by causing compression of a bronchus or the production of atelectatic areas. In view of the above findings, it would seem that Eliasberg and Neuland are not justified in saying that treatment is unnecessary, for not only should the usual antituberculosis regimen be inaugurated, but the advisability of producing an artificial pneumothorax must be seriously considered. —*Zur Kenntnis der epituberkulösen Infiltration der kindlichen Lunge, B. Epstein, Jahrb. f. Kinderhk., part 2–3, August, 1922, xcix, 59.*

Spontaneous Pneumothorax in Infant.—A child of 11 months, ill with bilateral bronchopneumonia, showed signs of a right pyopneumothorax, confirmed by the radioscope, two weeks before its death. At the autopsy an ulcer, 5 mm. in diameter, leading into a cavity the size of a large pea, was found near the diaphragm. In other regions of the right lung tubercles were found. There were none in the mediastinal lymph nodes nor in other organs.—*Pneumothorax spontané chez un enfant de 11 mois, Pélin, Barre and Reboul, Meeting Soc. Méd. des Hôpitaux d. Lyon, June 5, 1923, Reported in Presse Med., June 16, 1923, no. 48, 545.*

Diagnosis of Tuberculous Adenopathy in Children.—In the diagnosis of childhood tuberculosis, the importance of a history of exposure to infection has been overestimated, except in the presence of symptoms referable to no other infection. A negative history of exposure to tubercu-

lous infection does not exclude tuberculosis. Regarding the Pirquet test, a positive reaction is of more significance, the younger the child; it is of greatest value when negative, in excluding tuberculosis. Symptoms of bronchial node disease are less characteristic than those of adult pulmonary tuberculosis; cough is less common, hemoptysis is rare, while fever and rapid pulse may be due to other causes. Of greater importance are a loss of weight, a failure to gain weight over a period of several months, and a ready fatigability. Physical signs often are of questionable value. The roentgen ray may help in making the diagnosis but should not be used to the exclusion of other methods. A roentgenological study of children's lungs has created the following impressions: 1. The chest should be symmetrical, the trachea in the midline, bifurcating in front of the body of the fourth dorsal vertebra or a little lower. The domes of the diaphragm are smooth; the right diaphragm is in front of the eighth interspace and the left slightly lower. The heart is more nearly transverse than in the adult, and in the very young the thymus shadow is sometimes recognized about the aortic arch. The hilum shadow is located in the inner zone, and extends upward to about the fifth rib, posteriorly, and downward till it crosses four ribs and intervening rib spaces; its width and density vary widely in health. The lung fields show no markings in the outer zone, and in the very young none in the middle zone. 2. At birth, lung markings, that is, trunks shadows, are absent and the hilum shadow is small. 3. As the child gets older, dust inhalations and infections make for more distinct shadows. The hilum shadow is produced by lymph nodes, thick-walled bronchial tubes, blood-filled vessels and connective tissue binding them together; these shadows increase in density and area whether a history of infection is obtainable or not. 4. Lymphadenopathy becomes apparent after the common diseases of childhood, especially those which involve the respiratory tract, such as whooping cough and measles, and may appear after other infections, such as chronic appendicitis and diseased teeth and tonsils. Tuberculosis should not be read into films showing large hilum shadows unless these other causes can be excluded. 5. There is a group, presenting as its salient feature, marked hypertrophy of the tracheobronchial lymph nodes, and another group in which the same hypertrophy is associated with calcification of the nodes. All but one of those with calcified nodes occurred in cases in which tuberculous bone lesions were present; these children were in good health so far as their chests were concerned. The question is raised whether calcification of the hilum lymph nodes necessarily indicates the presence of tuberculous processes.—*A Clinical and Roentgen Ray Study of Tuberculous Broncho-adenopathy, T. Frazer and J. D. MacRae, J. Am. M. Ass., May 5, 1923, lxxx, 1292.*

Tracheobronchial Adenopathy of Older Children.—Neither the stethoscopic nor radiological signs suffice for the easy and infallible diagnosis of an adenopathy; the mediastinal shadows are easy to interpret, but the hilum shadows are often wrongly diagnosed. Nor should a tracheobronchial adenopathy be, *a priori*, regarded as tuberculous; other infections such as measles and whooping cough may be responsible. Reaction to tuberculin alone is evidence of a tuberculous nature. Positive skin reactions were obtained in 130 and negative reactions in 64 children with completely similar clinical symptoms. Too great a dependence on radiological signs and neglect to study the skin reaction lead to placing nontuberculous patients in sanatoriums not suited for them.—*Les adénopathies tracheo-bronchiques de la second enfance, Bernard and Vitry, Meeting Acad. d. Méd., Paris, July 10, 1923, Reported in Presse Méd., July 14, 1923, no. 56, 619.*

Bitonal Cough in Bronchial Node Tuberculosis of Infancy.—The bitonal cough, consisting of two tones, as if produced by two different larynges simultaneously, is contrasted with the ordinary cough which is a monotone. In infancy, the bitonal cough always indicates tuberculosis of the tracheobronchial lymph nodes. In such cases the tuberculin test is always positive. The physics of the production of the bitonal cough is discussed, tracheal compression being the essential factor.—*La toux bitonale dans la tuberculose des ganglions trachéo-bronchiques chez l'enfant du premier age, A. B. Marfan, Nourrisson, May, 1923, xi, 157.*

Sudden death of Child from Caseous Lymph Node.—A boy of nine was admitted to the hospital for cough, fever and pain in the right side, from which he had suffered for two days. He was flushed but in no distress. The temperature was 102°F. There were impairment of percussion note and air entry over the right lower and middle lobes, and two days later an area of tubular breathing below the angle of the right scapula. The cough was dry and hacking. On the fourth day of illness the boy died suddenly in an attack of violent, dry coughing. Autopsy revealed two ounces of turbid liquid in the right pleural cavity and a thin film

of fibrinous exudate over the right lower lobe which was consolidated and contained areas of tuberculous softening. There were a few miliary tubercles in this lung. Below the right bronchus was a cavity, with an impacted caseous mass, evidently a lymph node. Deeper in the hilum was a second caseous node about an inch in diameter, which was suppurating, and had perforated into one of the medium-sized bronchi.—*Sudden Death from Blocking of the Air Passages by a Caseous Gland in a Boy of Nine Years, F. J. Poynton and W. Williams, Brit. J. Child. Dis., January–March, 1923, xx, 28.*

Apical Pleurisy in Tuberculous Infants.—Among infants giving definitely positive tuberculin reactions, with clinical or radiological signs of tracheobronchial adenopathy or perhaps other local tuberculous manifestations, the author calls attention to certain cases with thoracic signs indicative of tuberculous infiltration of the lung, but in which the later course was favorable. Seven such cases are reported in detail, including roentgenological findings. The signs consisted of apical dulness more marked anteriorly, (left-sided in three cases, right-sided in four), with exaggerated breathing in these areas, but without adventitious sounds, except occasionally scattered bronchial râles. One case developed serofibrinous pleurisy on the same side. X-ray pictures showed uniform apical shadows, and in all cases tracheobronchial adenopathy. The author interprets the signs as indicative of apical pleurisy, with fibrinous deposits more or less slowly absorbed. The outcome was good in all cases.—*Pleurite du sommet chez les enfants bacillaires, J. P. Garrahan, Arch. d. méd. d. enfants, April, 1923, xxvi, 197.*

Tuberculous Osteo-Arthritis in Infancy.—The importance of accurate differential diagnosis is stressed. Diagnosis from "blennorrhagic arthritis" and from "luetic osteochondritis" is not considered, because of the great rarity of tuberculous osteoarthritis during the first six or eight months of life. The difficulty of diagnosis from rickets and scurvy is pointed out. The prognosis for these cases, as for all cases of surgical tuberculosis in infancy, is grave. Finally, immobilization and other forms of treatment are discussed. The value of rest alone is emphasized, as is also the fact that parents are likely to demand more active therapy.—*Ostéoarthrites tuberculeuses du nourrisson, A. Broca, Nourrisson, March, 1923, xi, 81.*

Pediatrician and Joint Tuberculosis.—The diagnosis and treatment of this form of tuberculosis are here summarized for the benefit of the pediatrics practitioner. Special emphasis is laid upon the necessity for completely ruling out other joint conditions which simulate tuberculosis; for early decision as to whether or not operative measures should be employed; for the correction of existing deformity at the outset; for recumbency continued over a long period of time; for adequate constitutional treatment.—*What the Pediatrician Should Know About Joint Tuberculosis, E. King, Arch. Pediat., June, 1923, xl, 392.*

Chronic Tuberculous Splenopneumonia in Children.—There were, in the course of a year, among 230 children with tuberculous lesions observed at the Debrousse Hospital, 5 cases of children about twelve years old who had come to the hospital with various diagnoses and whose condition came within the following description: Their general health and appearance was good; they had no fever and no dyspnea; they had little or no cough; good appetite; they were able to play without apparent fatigue. Radiological examination showed absolute and homogeneous opacity of half the thorax; the opposite side was completely normal. Their physical condition corresponded nearly to splenopneumonia, such as Grancher described it in 1883. Insufflation of the pleural cavity showed an absence of adhesions; nevertheless, the lung would not collapse; the condition, therefore, must be due to condensation of the pulmonary parenchyma. This number among 230 tuberculous cases seems to show that the condition is less exceptional than has been thought. So many cases in the second period of childhood create a suspicion that the cause may reside in incomplete allergy, a condition of resistance intermediate between that of the infant who succumbs and the adult who develops localized lung lesions.—*La spléno-pneumonie tuberculeuse chronique chez l'enfant, Armand-Delille, Isaac-Georges and Ducrohet, Presse Méd., June 20, 1923, no. 49, 551.*

Comparison of Different Kinds of Tuberculin in Pirquet Reaction in Children.—With uniform technique, Pirquet reactions were done on 193 children, simultaneously applying O. T., *Cutituberculin* (Höchst-Farbwerke), Moro's "diagnostic tuberculin" (concentrated O. T. mixed with bovine tuberculin) and bovine tuberculin to the scarifications. There were 93 negative reactions in all, the first 60 of which were not tested with Moro's tuberculin. Of the

100 children with positive tests, 38 reacted positively to all brands of the material (only 11 tested with Moro's), and of the remaining 62, one or more of the tuberculins failed to give a reaction. O. T. gave 81 positive and 4 doubtful reactions; cutituberculin 42 positive and 4 doubtful; bovine 93 positive, 2 doubtful; and Moro's 25 positive, 5 doubtful. Negative reactions in this group of 100 positives were obtained 15 times with O. T., 54 times with cutituberculin, 5 times with bovine, and 5 times with Moro's (the latter used in only 35 cases). Expressed in percentages, in 100 children reacting positively, O. T. gave 85 per cent positive, 15 per cent negative; cutituberculin 61 per cent positive, 39 per cent negative; bovine tuberculin 95 per cent positive, 5 per cent negative; Moro's 83 per cent positive, 17 per cent negative. The intensity of the reaction is shown in the following table which comprises the cases giving positive tests with all the tuberculins:

	Old	Cuti	Bovine	Old	Cuti	Bovine	Moro
+	10	19	12	2	8	2	4
++	7	4	8	6	3	6	5
+++	10	2	7	3		3	2
	27			11			

The high percentage of reactions to bovine tuberculin may be explained perhaps in part by the apparent increase of bovine tuberculosis in Germany since the War.—*Ein Vergleich über die Brauchbarkeit verschiedener Tuberkuline für die Pirquetsche Reaktion, M. Frenzel, Monatschr. f. Kinderhk., October, 1922, xxiv, 70.*

Wildbolz Auto-Urine Reacton in Children.—The Wildbolz reaction was tested out in Hamburger's clinic (Gratz) with the following results: Six children with repeatedly negative tuberculin tests gave negative reactions with their own urine as well as with the urine of children with undoubted tuberculosis. Four children with positive tuberculin tests but no demonstrable tuberculosis failed to react to their own urine or to the urine of children without tuberculosis or with merely positive Pirquets but no other evidences of tuberculous infection. However, all 4 reacted positively when the urine of actively tuberculous children was used. One child with serous pleurisy and positive tuberculin tests, 2 with tuberculosis of the spine and 9 with pulmonary tuberculosis, all reacted positively to both their own urine and the urine of other children with manifest tuberculosis. In only 2 instances was the reaction positive when the urine of children who were free from tuberculosis was used. One child with severe renal and intestinal tuberculosis gave only a feebly positive test during the period of marked cachexia, but reacted much more strongly later on when his general condition had improved. One case of tuberculous meningitis (autopsy six days after admission) failed entirely to react.—*Beitrag zur Eigenharnreaktion nach Wildbolz, A. Andreasch, Arch. f. Kinderhk., July, 1922, lxxi, 169.*

Examination of Blood of Children for Tubercle Bacilli.—The investigation was undertaken with a view to determining whether the tubercle bacilli can be detected in the blood in children under 15 years of age, at the time of what would appear to be the primary infection. There were two groups of cases: 1. Those in which there were clinical signs of lymph node involvement, either of the mesenteric or the cervical nodes, and cases in which the disease had spread so that the peritoneum or lungs were also involved. In the cases in which the lung was affected no confirmation was afforded by the finding of tubercle bacilli in the sputum. 2. Cases in which the clinical signs were those of pulmonary tuberculosis and in which the diagnosis was established by the finding of tubercle bacilli in the sputum. The blood was withdrawn by venapuncture, citrated and injected into guinea pigs. Two animals were used for each subject. *Conclusions:* 1. A total of 43 cases of tuberculosis in children under 15 years of age have been examined. The cases varied from those with slight involvement of the nodes to those in which the infection was widespread in the lungs and in which tubercle bacilli were found in the sputum. 2. In no case were tubercle bacilli shown to be present in quantities of blood varying from 1.5 to 10 cc. 3. Blood was taken both during apyrexial and pyrexial periods. The presence therefore of slight or extreme toxemia would not appear to show that the blood was necessarily infected. 4. It would appear from this investigation that infection of the blood by tubercle bacilli in children suffering from tuberculosis is not of such an extent as to be detectable by the inoculation of small quantities of blood into animals. The evidence collected would therefore suggest the following possibilities: (a) the number of bacilli circulating in the blood is too small to be detected by the withdrawal of amounts of blood up to 10 cc.; (b) that the bacilli are only discharged into the blood at intervals, that is, it is an embolic rather than

an elimination process, as in renal infection; and (c) that extension of disease takes place by means of some other route such as the lymphatic system. The localizing of disease that is found postmortem in children dying of tuberculosis is striking. Frequently in such cases the lungs may be riddled with tubercle yet an examination of the mesenteric and other lymph nodes and organs may not show naked eye appearance of infection. This observation has not yet been verified by microscopic examination of sections in any large number of cases but the point is being investigated.—*The Occurrence of Tubercle Bacilli in the Blood Stream in Tuberculous Children, C. D. S. Agassiz and S. R. Gloyne, Tubercle, July, 1923, iv, 433*

Sedimentation Velocity of Erythrocytes in Childhood Tuberculosis.—Fahreus holds an increased agglutination of red blood cells responsible for the "sedimentation phenomenon." Adler contends that increase of serum globulins and decrease in albumins is the causative factor. Others ascribe it to the variations of the serum fibrinogen content. The variation in the velocity is observed in many diseases, but not so constantly and regularly, and therefore of such diagnostic and prognostic value, as in tuberculosis. The author's method is very simple: 0.8 cc. of venous blood is drawn up into a 1 cc. syringe containing 0.2 cc. of a 5 per cent solution of sodium citrate, mixed thoroughly and placed in a small tube. This is left at room temperature and the time noted that is required for the red cells to settle to a point 18 mm. from the bottom. The author does not mention the diameter of the tube. The normal for men is 1200 to 1400 minutes, for women 800 to 1000 minutes (600 during menstruation) and for children 500 to 800 minutes. The sedimentation velocity increase with age: 250 to 280 minutes at 1 to 2 years; 400 to 500 at 7 years; 600 to 700 at 12; and 800 at 15 years. In childhood the purely fibrotic lung cases give results of 115 to 400 minutes, lymph node types, 50 to 80 minutes; and exudative types of tuberculosis 20 to 44 minutes. The test is especially valuable in lymph node tuberculosis when the question of activity is in doubt. In bone tuberculosis the time is decreased markedly a long time before suppuration sets in. With values below 20 minutes a positive urochromogen reaction is always obtained. Chronic bronchitis and bronchiectasis give normal values. The prognostic value of the test is great. When the time begins to increase the prognosis is always favorable and *vice versa*. The test is also invaluable in specific treatment. The progress of the disease can be followed with this test as well as with serial Roentgen-ray pictures—*Die Bestimmung der Senkungsgeschwindigkeit der Erythrocyten bei kindlicher Tuberculose, Elizabeth Dehoff, Deutsch. med. Wchnschr., May, 1923, xlix, 578.*

Hemoclinic State in Prognosis of Tuberculosis in Children.—Examination of the blood in the following respects, serum lipase content, speed of settling of erythrocytes, and serum protein content, is a valuable prognostic aid in tuberculosis. Serum lipase is believed to be a measure of resistance; the speed of settling of red blood corpuscles stands in direct relation with tissue destruction; serum protein is increased in moderately advanced tuberculosis, while in far advanced cases the value is reduced to about normal. With the range of normal figures at hand the clinician can watch the tendencies of development in his patients. Examination of about 300 children giving positive Pirquet reactions, with a range of severity of disease from far advanced to undiagnosable, showed that the nonspecific reactions which form the basis of the hemoclinic state are regularly dependent upon specific processes in the organism affected with tuberculosis.—*Der hämoklinische Status bei der Beurteilung der Tuberkulose des Kindes, Asal and Falkenheim, München. med. Wchnschr., March 9, 1923, 291.*

Nutritional Therapy in Tuberculosis of Infancy.—This rather lengthy article, as well as the one following it by Happ and Wagner, is more a study of the effect of the presence or absence of the fat-soluble A vitamine than of tuberculosis. For the purposes of the study, 9 infants with tuberculosis were selected, and numerous careful measurements of weight, length, chest circumference, etc., were made before, during and after a prolonged period of feeding on a diet (skimmed milk) poor in fat-soluble A vitamine. Although adequate in calories, this diet seemed to influence unfavorably both growth and weight. Elaborate tables of measurements taken during the experiments are appended.—*Therapeutische Ernährungsversuche bei der Säuglingstuberkulose. I, R. Wagner, Ztschr. f. Kinderhk., April 16, 1923, xxxv, 137.*

Nutritional Therapy in Tuberculosis of Infancy.—This is a continuation of the discussion in the preceding article on the effects of feeding a diet poor in fat-soluble A vitamine to infants with tuberculosis. Extensive protocols are given of 2 cases and résumés of 7 others, which seem to show that prolonged feeding of diets low in fat-soluble A cause a slowing up in the rate of growth, and

exercise an unfavorable influence on the tuberculous process. The presence of an abundance of this accessory food factor in the dietary (in the form of whole milk and cream) appears to be of distinct benefit in the fight against tuberculosis. During the period of low fat-soluble A feeding there was failure to gain in weight and length, and pallor, flabby musculature, flabby, dry skin, anorexia, a lessened activity, and perhaps an increased tendency to infections. Although there is no specific effect on the tuberculous process, certainly this is indirectly influenced by the general effect on nutrition and growth of a diet adequate in this vitamine.—*Therapeutische Ernährungsversuche bei der Säuglingstuberkulose. II, W. M. Happ and R. Wagner, Ztschr. f. Kinderhk., April 16, 1923, xxxv, 152.*

X-Ray together with Heliotherapy in Tuberculosis of Children.—Children with tuberculosis of lymph nodes, skin, joints, serous membranes and bones, were treated by heliotherapy, climatotherapy and X-ray therapy. Cases are presented, with many illustrations. Climatotherapy, with careful regimen and special attention to nutrition, is of greatest importance. X-ray therapy is the most important additional measure at our disposal. As is well known, the best results are obtained in the "surgical tuberculosis" of children.—*Roentgen-terapia nelle lesioni tubercolari in rapporto alla elioterapia, A. Corica, Pediatria, March 1, 1923, xxxi, 247.*

Types of Pulmonary Tuberculosis at Various Ages.—There is no difference in the relative incidence of fibrotic and proliferative cases in young and old patients. In exudative cases the contrast between the course of the disease in the young and the aged is very marked. In the young there is a distinct tendency for the proliferative type to pass into the exudative type, while in the aged the exudative type follows a type of the disease which is exudative but which has periods of a transitory fibrosis with temporary clinical improvement. The fourth decade of life shows a very markedly increased number of cases of the proliferative type. In the fifth decade there is an increased number of the exudative type.—*Über Beziehungen der zirrhotischen, proliferativen und exudativen Form der Lungentuberkulose zum Lebensalter, K. Lydtin, Ztschr. f. Tuberk., January, 1923, xxxvii, 260.*

Extensive Calcification of the Pulmonary Lymph Nodes.—Only one other case has been reported, by Brauer (Heisler and Schall) in 1909, in which there was an extensive calcification of the glands of the hilum, and also in the lung fields themselves. Gerhartz's case is, however, more extensive. Both hila and the neighboring lung tissue revealed numerous round shadows. They were of such density that they could not be calcified pulmonary lesions. The typical form and localization speak for their lymph node nature. Their tuberculous nature is indicated by the tuberculosis heredity of the patient.—*Über ausgedehnte Verkalkung des Lungenlymphdrüsensystems, H. Gerhartz, Beitr. z. Klin. d. Tuberk., April, 1922, li, 296.*

Annular Shadows in Pulmonary Tuberculosis.—Annular shadows are practically always viewed as cavities, even when auscultatory or percussion cavity signs are absent. This view is, however, not always concurred in; but it is believed that localized, walled off spontaneous pneumothoraces or seropneumothoraces can occur more frequently than is ordinarily believed. A series of cases is reported. Definitely tuberculous lungs revealed annular (6 to 9 cm.) shadows, which became larger or smaller and finally disappeared, roentgenologically, so that the idea of cavity could not be entertained. Aside from this, the clinical behavior of the patient spoke against cavity. The view is entertained that these findings indicate a spontaneous, interlobar, encapsulated, localized pneumothorax. Cases described have not previously been reported in European literature, but there are reports in American literature. No opportunity presented itself to verify the idea pathologically.—*Beitrag zur Kenntnis des lokalisierten Pneumothorax bei Lungentuberkulose, H. Dahlstedt, Beitr. z. Klin. d. Tuberk., July, 1922, lii, 79.*

Lung Volume and Blood Flow Following Pneumonectomy.—Determinations were made in six dogs of the total volume of air in the lungs at the height of inspiration, the amount of blood flowing through the lungs per minute, and the pulse rate immediately before and after operation and on alternate days thereafter. The total volume of air in the lungs was determined after the method of Van Slyke and Binger, with analysis by the Haldane method; the amount of blood flowing through the lungs per minute was calculated from the total minute output of carbon dioxide and the difference in the carbon dioxide content of the arterial and venous blood, using an air-tight valve, connected by a three-way valve with a spirometer over water covered with oil. There was an average decrease of about 42 per cent in total lung volume immediately following

the operation, succeeded by a rise which reaches the preoperative level in from twenty to twenty-six days. A few hours after operation the amount of blood flow through the remaining lung per minute was greater than that flowing through both lungs prior to operation, the average increase being 40 per cent, with variations between 17.2 and 59.1 per cent. Removal of one lung caused an average increase in pulse rate of 26 per cent, within six hours, which returns gradually to the preoperative rate by the tenth day. The increased blood flow runs about parallel with the increased pulse rate. It is also noteworthy that Heuer in some previously unpublished work has in several instances found a hypertrophy of the right ventricle. *Summary:* In addition to the previously observed effects of pneumonectomy in dogs the following changes of a respiratory and circulatory nature have been observed: 1. A marked decrease in the total lung volume which persists about thirty days, then returns to normal. 2. A transient increase in the pulse rate and the blood flow through the remaining lung persisting for about ten days. The pulse rate falls by a greater amount than does the blood flow through the lung. The decrease in lung volume is to be considered a detrimental effect of pneumonectomy, while the increase in blood flow and pulse volume may be taken as compensatory mechanisms. —*Observations on the Total Lung Volume and Blood Flow Following Pneumonectomy, W. D. W. Andrus, Bull. Johns Hop. Hosp., April, 1923, xxxiv, 119.*

Pulmonic Area of the Heart as an Index of Cardio-Pulmonary Circulatory Disturbance.—In the examination of patients to determine the functional capacity of the heart or lungs, fluoroscopy has given us one of the most accurate as well as most simple methods. In acute infectious diseases the dilatation of the pulmonic area has been roentgenographically noted by some investigators and considered to have a definite relation to the embarrassment of heart and disturbance of pulmonary circulation. The pulmonic area lies just above the left auricular outline or portion of the heart, when viewed from the anterior position, between the second and third ribs. The reaction or sign is best described as an increase in the density and size of the pulmonic area but in reality it is more than this. In the average case in which there is a reaction, the curve of the pulmonic area is very definite; and in cases where the heart is impaired, and in turn the pulmonic circulation, this curve becomes greater, so that there results, to a varying extent, a bulging with increasing density, visible mostly on the left of the mediastinum, at the level of the second rib and space, sometimes as large as a small orange. The greater the impairment of the cardiopulmonary circulation the greater is the dilatation of the pulmonic area and increase of density of this area. The reaction, however, is not visible during deep inspiration and is sometimes barely visible during normal respiration. The reaction is definitely obtained and its degree estimated on coughing. The patient should be made to cough in fairly rapid succession, three of four times, without inspiratory effort between coughs. As the patient coughs, attention is directed to the pulmonic area which immediately grows denser and larger as the air in the lungs is expelled. After coughing, the patient is told to take a deep full breath and the aeration (transparency) of the lungs is contrasted before the test is repeated. As the test is somewhat severe, great care should be taken with active pulmonary cases and especially cases that have a history of hemorrhage. This reaction was often noted by the author during the epidemic of influenza, especially in severe and acute cases. Diagrams and theories as to the physiology of the reaction are added. *Conclusions*: 1. The pulmonic area of the heart, fluoroscopically seen, presents certain changes in outline, size and density under certain conditions affecting heart and lungs. 2. This pulmonic sign is a reliable index of cardiac embarrassment. 3. It varies according to the degree of disturbance of cardiopulmonary circulatory function.—*The Pulmonic area of the Heart as an Index of Cardiopulmonary Circulatory Disturbance, J. A. Honeij, Boston M. & S. J., May 24, 1923, clxxxviii, 811.*

Tuberculosis and Capillary System.—The peak of morbidity of tuberculosis of the lungs and of miliary tuberculosis and scrofula in early life, the sensitiveness of the tuberculous focus during menstruation, and the higher morbidity and mortality of tuberculosis in the girl menstruating early, are all to be attributed partly to the condition of the capillary system, particularly to wide capillaries with slack walls and to a rapid blood stream. This condition occurs in menstruation and periodically in the early years of life. In addition to the capillary changes there is a more rapid settling of the red blood corpuscles, an increase of fibrinogen and globulin, and a lessening of the calcium content of the blood. The capillaries themselves are more permeable. Active tuberculosis decreases the natural irritability of the capillary walls. If one scratches the skin of patients who have inactive tubercu-

losis, a line of hyperemia develops shortly thereafter in 70 per cent; in active tuberculosis only 28 responded in a similar manner.—*Tuberkulose und Kapillarsystem, W. Hagen, München. med. Wchnschr., April 27, 1923, 532.*

Vital Capacity as Influenced by Age and Obesity.—*Conclusions:* Using standards based on persons between ages 20 and 30, the vital capacity is within normal limits up to the age of 50; thereafter the fall is gradual, reaching 50 per cent at age 85. The greatest drop is between ages 50 and 60. 2. The vital capacity of obese and "overweight" people is but slightly less than normal, using the height standard, but averages 20 per cent less by surface area to age 50. 3. The height standard, or the addition of 20 per cent to the result obtained by using the surface area standard, may be used in estimating the vital capacity of obese or "overweight" subjects. 4. The tendency to dyspnea, which is often present in people who are much overweight, may be accounted for, in part, by a reduction of the vital capacity. 5. It appears advisable to reduce the weight of obese people slowly if there are annoying symptoms of a cardiac nature. This is especially so if the vital capacity shows a definite reduction.—*The Relation of Age and Obesity to Vital Capacity, B. D. Bowen, Arch. Int. Med., April 15, 1923, xxxi, 579.*

Alkali Reserve in Pulmonary Tuberculosis.—Having found in tuberculous subjects with extensive lesions of one or both lungs an alveolar air with a greatly increased carbon dioxide content (about 6 per cent), it seemed probable that the dissociation curve of CO_2 in the blood would be higher than in tuberculous subjects with small apical lesions, who have, it is known, a normal alveolar pressure of CO_2. Analysis of arterial blood gave 56 to 57 volumes per cent of CO_2 in subjects with extensive lesions, and 51.5 volumes per cent in subjects with small localized lesions, which is the same amount found in normal subjects. The capacity of the blood for CO_2 was determined in 6 tuberculous subjects with extensive chronic lesions of both lungs. None of them had fever; none was dyspneic at rest. In all of them the alkali reserve was found to be considerably greater than normal. In four subjects with lesions localized at one or both summits the capacity of the blood for CO_2 was measured. Three of them had curves absolutely normal; the fourth, a patient with signs only of a left apical lesion, but who had, as the result of an old pleurisy and pneumonia, considerably less than normal expansion of the left thorax and almost complete respiratory silence on the left side, gave a curve which was even higher than any of the patients with extensive lesions. Such mechanical obstructions may, therefore, also increase the alkali reserve. This increased power to unite with CO_2 which is possessed by the blood of subjects having extensive pulmonary lesions enables the blood to maintain its normal reaction in spite of the increased carbon dioxide pressure in the alveolar air.—*La courbe de dissociation de l'acide carbonique dans la tuberculose pulmonaire, L. Dautrebande and H. W. Davies, Compt. Rend. Soc. d. Biol., March 10, 1923, lxxxviii, 647.*

Prognostic Value of Basal Metabolism.—The basal metabolism, determined at the beginning of an exacerbation of incipient pulmonary tuberculoses, may furnish prognostic information concerning patients with apparently equal chances of improvement. A rapid increase in metabolism is a bad sign; in most cases it is associated with clinical symptoms of hyperthyroidism.—*Metabolism basal des tuberculeux incipients. Sa valeur dans la pronostic des poussées évolutives et le dépistage de hyperthyroïdes frustes et aggravante, V. Cordier, Compt. Rend. Soc. d. Biol., March 24, 1923, xxxviii, 782.*

Fat Metabolism in Lung.—The rapidity with which neutral fats, fixed by the lung, become converted into lipoids was shown by injecting olive oil into the veins of dogs and following its course in the lungs. Five minutes after an injection of 15 cc. of oil, 100 gm. of lung tissue, which before the injection had contained 2.78 gm. of fat held 8.69 gm.; three hours later the amount had fallen to 3.86 gm. In a dog to whose lungs the circulation was limited as far as possible, in order to avoid migration of fat from the lungs into other organs, part of one lung was cut off from the general air supply, but its blood supply was not interfered with. The disappearance of fat from the aerated and non-aerated portions was then determined. Fat disappeared from the ligated lobe, but more slowly than from the aerated portions. In the former case the indispensable oxygen presumably came from the blood, which was superoxygenated because of the reduction of the circulatory path and the thorough artificial respiration.—*Lipodiérèse pulmonaire, H. Roger and L. Binet, Compt. Rend. Soc. d. Biol., April, 28, 1923, lxxxviii, 1079.*

Action of Human Lung on Fat.—The interesting work, in which Roger and Binet have shown the selective action of pulmonary tissue on fats, warrants an inves-

tigation of fat behavior in living human lungs. Iodinized oil was injected into the cerebrospinal fluid, into the muscles, and into the trachea through the intercricothyroid space. During the five days after injection 0.5 per cent of the iodine in the cerebrospinal fluid reappeared in the urine; 1.5 per cent of the amount injected into the muscles was recovered, and 20 to 22 per cent of the iodine injected into the trachea. After an intratracheal injection of 5 cc. of oil, representing 2.70 grams of iodine, the urine of the first day contained 0.2069, that of the second day 0.1399, that of the fifth day 0.0369. The rapid fall in iodine excretion indicates a rapid fat-splitting action in the lungs. These results are corroborated by X-ray findings: iodized oils are opaque to the X-ray because of their large iodine content. The shadows persist for months after injections into the muscles or spinal cord and disappear very rapidly after intratracheal injections.—*La lipodiérèse chez l'homme, Sicard, Fabre and Forestier, Compt. Rend. Soc. d. Biol., March 3, 1923, xxxviii, 564.*

Relative Activity of Lung Tissue in Converting Fats to Lipoids.—Intravenous injections of iodinized oil in small doses is well borne and this permits a wide distribution of the fat in the blood vessels. After injecting 2 cc. of *iodipin* it was found that the amount of iodine excreted in the urine increased up to the eighth day and then fell off, till at the nineteenth day it was very small. This is quite different from the result of intratracheal injection, after which the maximum elimination occurs in the first day after injection and is rapidly completed in about five days. It seems evident that the oil is rapidly split up as soon as it comes in contact with lung tissue and that its disintegration proceeds at a rate far greater than in the muscles or the cerebrospinal fluid. Taken by the mouth, the oil is likewise eliminated very rapidly, mostly through the lymphatics.—*La lipodiérèse chez l'homme, Sicard, Fabre and Forestier, Compt. Rend. Soc. d. Biol., May 19, 1923, lxxxviii, 1255.*

Milky Effusions.—The probable cause of milky effusion is discussed. The author believes that emulsified fat alone is the cause of the milkiness and that it is derived from the chyliferous ducts, either through direct ulceration or through filtration. The blood itself must also be considered as a possible source through filtration. In the literature quoted 14 per cent of these milky effusions are ascribed to tuberculosis. Seven cases were recorded, in all of which milky fluids were found. In one case, in which the patient had a tumor of the mediastinum, the fluid contained large amounts of fat in coarse and fine emulsions. This fluid can well be called chylous. In the remaining 6 cases, in all of which the patients were known to have lesions capable of effusion from chyliferous or blood vessels, the fluids contained smaller amounts of fat, in very fine emulsions; these fluids might be classed as pseudochylous, but the only difference between them and the first fluid is that they lacked large fat particles. The terms *pseudochylous* and *chyliform* are descriptive and imply much that is not true, and had better be discarded. The term *chylous* is accurate and general enough to designate all milky effusions save those that can be shown to originate from lipemic blood.—*Chylous and Pseudochylous Effusions, A Report of Seven Cases, M. A. Blankenhorn, Arch. Int. Med., July 15, 1923, xxxii, 129.*

Experimental Tuberculosis of Cats.—Cats have been held to be resistant toward human, and variable toward bovine tubercle bacilli taken into the alimentary canal. By way of testing these premises four cats were fed twice daily for one month with sterilized milk, to which was added 4 or 5 cc. of sputum containing about 30 bacilli in each field of the microscope. Two cats were between 4 and 5 months, the others were 2 years old. Three months later they all began to lose weight and died after a period of cachexia within four to five months from the beginning of the experiment. The autopsy showed no abdominal lesions either of lymph nodes or of other structures. The lungs and the lymph nodes of the thorax were sown with nodules and fatty or caseous granules. Two guinea pigs inoculated with material from their lungs died in 58 and 61 days; they showed lesions of the type produced by human tubercle bacilli. The failure of previous efforts to tuberculize cats may be explained as due to the absence of long repeated dosage. These cases confirm the prevalent belief that tuberculous infection results from prolonged repeated contaminations.—*Tuberculisation du chat par ingestion de crachats a bacilli du type humain, C. Cernaianu, Compt. Rend. Soc. d. Biol., May 12, 1923, lxxxviii, 1233.*

Unfitness of Guinea Pig for Detecting Infectious Localities.—In order to test the notion that guinea pigs may be used to reveal the infectious nature of particular places five cages containing 3 guinea pigs each were placed in situations such as a small room where suppurating wounds were dressed and the soiled dressings thrown near

the cage; a dining and living room for tuberculosis patients; an isolation ward for advanced patients, and other situations that seemed likely to contain numerous tubercle bacilli. All the exposures were in an improvised hospital, where an attending doctor and a nurse had died of tuberculosis, and where two other nurses had acquired it. The experiment lasted six months. Two animals died without evidence of tuberculosis. The whole number had increased to 21; these were killed and most minute examination revealed no signs of tuberculosis.—*Le cobaye peut il être utilisé dans la lutte contre la tuberculoses, pour le contrôle de la salubrité des locaux? P. Remlinger, Compt. Rend Soc. de Biol, March 17, 1923, lxxxviii, 658.*

Effect on Tuberculosis of Lack of Vitamine C.—Guinea pigs deprived of Vitamine C were inoculated with extremely small doses of tubercle bacilli. In the animals affected the appearance of the inoculation chancre and the adenopathy was hastened and the extension of the lesions to the spleen was more rapid than in the controls.—*La tuberculose chez les cobayes privés de vitamine C, E. Coland, V^e Congres National de la Tuberculose, Strasbourg, June 2–6, 1923, Reported in Presse Méd., July 11, 1923, no. 55, 611.*

Particulate Matter Injected Intravenously.—It has been shown that manganese could be quantitatively analyzed accurately and readily in animal tissues, even when in high dilution; hence, useful quantitative experiments upon the deposition and excretions of foreign particles can be accomplished. Thus, more exact studies of lung fibrosis due to foreign material might be made if dusts susceptible to chemical quantitation were employed. Previous experiments with manganese dioxide, given intravenously to cats, have shown that it is possible to deposit particles averaging one μ in diameter in the lung capillaries. These particles are deposited initially on the blood side of the lung parenchyma in contrast to the normal or alveolar side of the lung tissue. Sooner or later a part of the manganese dioxide passes out of the vessels into the alveolar walls and comes to occupy the position which would be taken by inhaled particles carried into the lung tissue from the alveoli. Further experiments were done with manganese dioxide and rhodonite (manganese silicate), and the results are summarized as follows: 1. Suspensions of manganese dioxide given intravenously to cats are virtually eliminated from the body in one week. 2. As the process of removal goes on there is a transfer of manganese from lungs to liver. 3. Similar suspensions of manganese dioxide given intravenously to rabbits are excreted more rapidly, owing to the fact that in these animals the lungs are not involved and the whole process of removal from the blood is carried on by the liver. 4. A method for the quantitation of rhodonite is given. 5. Three different suspensions of rhodonite, varying in the size of the largest particles from 1.3 to 0.2μ, when injected intravenously into cats, showed greater and greater tendency toward arrest in the liver as the size of the individual particles became smaller. When suspensions containing particles averaging 1.1μ are injected the primary sites of deposition are similar to those observed for manganese dioxide suspensions similarly injected. The disappearance of rhodonite is exceedingly slow and is apparently completed about fifty days following the injection. 6. Rhodonite should prove a suitable substance with which to attempt the production of lung fibrosis in cats through the medium of intravenous injection. Manganese dioxide lacks permanency after deposition and is consequently unsuitable for studies upon chronic changes induced by foreign substances.—*The Deposition and Subsequent Course of Particulate Material (Manganese Dioxide and Manganese Meta-Silicate) Administered Intravenously to Cats and Rabbits, C. K. Drinker, L. A. Shaw and K. R. Drinker, J. Exper. Med., June 1, 1923, xxxvii, 829.*

Bacteria in Lungs after Inhalation.—Considerable discussion has arisen at various times as to whether inspired bacteria reach the lungs or are filtered out in the nasal passages. Experiments were done in the hope of obtaining further information concerning pulmonary infection under natural conditions Mice were used as the test animals. They were allowed to inhale an atmosphere in which a fine mist had been produced by spraying a culture of the organism to be studied. The bacteria used were pneumococcus, Streptococcus hemolyticus, Bacillus influenzae and staphylococcus. It was found that these bacteria readily penetrate into the lower respiratory tract. Pneumococci which have reached the lung as a result of this procedure usually disappear within a few hours and give rise to no infection. On the question as to whether they are killed *in situ*, taken up by the leucocytes, or carried to other parts of the body, these experiments throw no light. It seems probable that normally the conditions in the lungs of mice are unfavorable for infections with pneumococci, even when the number reaching the lower respiratory tract is considerable. Some mice were subjected to sudden chilling, and in others attempts were made

to lower local resistance by inducing slight injuries of the mucous membrane, by allowing the inhalation of ether or exposure to a spray containing finely divided quartz sand or talc in the form of dust. None of these procedures resulted in so changing conditions that infection occurred with any greater frequency than in the controls. Hemolytic streptococcus, on the other hand, persists in the lung for a considerably longer time and a general septicemia usually follows.—*The Presence of Bacteria in the Lungs of Mice Following Inhalation, E. G. Stillman, J. Exper. Med., August, 1923, xxxviii, 117.*

Mechanism of Bacteriostasis.—The effect of bactericidal agents is often tested by adding these substances to the media on which the bacteria are planted, and the assumption is usually made that if the substances, when present in the media, exhibit a selective hostility to bacteria, they will exhibit a hostility, selective in the same sense, when added directly to the bacteria themselves. This assumption is usually justified by the facts. For example, between gram-positive and gram-negative microorganisms, gentian-violet exhibits the same type of selective activity, whether the dye be added to the media on which the bacteria are planted unstained (extrinsic bacteriostasis) or the bacteria be stained with it before being planted on plain agar (intrinsic bacteriostasis). In both instances the gram-positives are inhibited and the gram-negatives unaffected. The term *bacteriostatic* is used advisedly. It is more conservative than bactericidal, and it is the one that should generally be used; for the great majority of experiments in this field, which are supposed to prove that the chemical substance under study has killed the experimental bacteria, really prove only that they have been injured or that their growth has been inhibited. With other dyes this parallelism does not always hold true. Between gram-positive spore-bearing aerobes and the commoner gram-negative bacteria, acid fuchsin, related sulphonic substances, and the flavines exhibit one type of selective activity when the dye is added to the media (extrinsic bacteriostasis) and the opposite type when it is added directly to the bacteria (intrinsic bacteriostasis). In the former case the gram-positive spore-bearers are inhibited and the gram-negative unaffected; in the latter case the gram-negatives are inhibited and the gram-positive spore-bearers unaffected. Selective bacteriostasis is not necessarily conditioned by selective penetrability. Stained bacteria may grow and the dyes which do not stain well may inhibit reproduction. There is evidence that the phenomena of bacteriostasis may be due to changes effected by the dye on the surface of the organism.—*The Mechanism of Bacteriostasis, J. W. Churchman, J. Exp. Med., April, 1923, xxxvii, 543.*

Bacteriostasis by Dye Mixtures.—The recent observation that acid fuchsin possesses a selective power which is in many respects the opposite of that of gentian violet suggested the advisability of studying the behavior of mixtures of dyes. Might it not be possible to fortify the weakness of one with the strength of another, and thus to obtain a mixture which, in dilutions weaker than that in which either dye alone was effective, would be static for the majority of the commoner bacteria? *Bacillus prodigiosus*, gram-negative, stained with gentian violet, is unaffected, whereas, if stained with acid fuchsin, it is killed. The opposite is true of *Bacillus anthracis*, a gram-positive microörganism. It proved, on trial, impossible to mix gentian violet and acid fuchsin, on account of the precipitate formed. Neutral acriflavine, which possesses a reverse selective bacteriostatic power, just as acid fuchsin does, was substituted for the latter. These two dyes, gentian violet and acriflavine, will mix, and the resultant mixture combines the selective virtues of its components. It was also found that dilutions of acriflavine which were too weak to affect gram-negative unstained microörganisms readily killed these when first stained with gentian violet. Gentian violet had prepared the way for acriflavine and lessened its task. There was, in other words, a supplementary selective bacteriostasis. The opposite also was found true, namely, bacteria previously treated with acriflavine become more susceptible to gentian violet. These two dyes, therefore, reinforce each other; in a mixture, far from interfering with, they supplement each other. If the two dyes, gentian violet and neutral acriflavine, be mixed together in equal quantities in a mortar and dissolved in water in a strength of 1 to 2,000 of the mixture, a plum-colored solution results. This solution is absolutely nonirritant for inflamed human mucous membranes (urethral). In laboratory experiments it is bacteriostatic for all the common aerobic microörganisms. From a few clinical tests (genitourinary) it seems probable that greater success can be obtained from it than from either dye alone.—*Bacteriostasis by Mixture of Dyes, J. W. Churchman, J. Exper. Med., July, 1923, xxxviii, 1.*